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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/575,910	05/23/2000	Gregory P. Kochanski	Kochanski 52-16	2477

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MENDELSON AND ASSOCIATES PC  
1515 MARKET STREET  
SUITE 715  
PHILADELPHIA, PA 19102

EXAMINER

GRIER, LAURA A

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 04/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/575,910

Applicant(s)

KOCHANSKI ET AL.

Examiner

Laura A Grier

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 24-28 is/are allowed.
- 6) ☒ Claim(s) 1,2,9-12,18-20,22,23,29-31 and 37 is/are rejected.
- 7) ☒ Claim(s) 3-8,13-17,21,32-36 and 38 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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## DETAILED ACTION

1. The indicated allowability of claims 10-12 is withdrawn in view of the newly discovered reference(s) to Narendra et al. U. S. Patent No 5339281. Rejections based on the newly cited reference(s) follow.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 1, 9-12, 18-19, 22, 30-31** are rejected under 35 U.S.C. 102(e) as being anticipated by Narendra et al., U. S. Patent No.5339281.

Regarding **claims 1 and 22**, Narendra discloses a compact deployable acoustic sensor. Narendra's disclosure comprises filtering (54) microphones (16-17), and combining the audio signals via a computing means using covariance matrix to process the signals in a nonlinear manner, therein, as claimed (col. 1, lines 58-68 - col. 2, lines 1-5, and 62-68, col. 5, lines 55-62, col. 7, lines 64- col. 8, lines 1- 54 and figure 3-5).

Regarding **claims 9 and 10**, Narendra discloses everything claimed as applied above (see claim 1). Narendra further discloses anti-aliasing filters (col. 5, lines 56-62), which reads filtering to dynamically adjusting to match to match each of the processed audio signals in amplitude and phase.

Regarding **claims 11 and 12**, Narenda discloses everything claimed as applied above (see claim 1). Narenda further discloses the beamforming algorithm having a median (col. 8, lines 43-54), which reads on the central value, therein.

Regarding **claims 18 and 19**, Narenda discloses everything claimed as applied above (see claim 1). Narenda further discloses beamforming technique (col. 6, lines 41- col. 7, lines 1-6), which reads on the nonlinear signal estimation processing of each set of input values of the processed audio signals independently and the processing being based on multiple values of each signal over a period of time.

Regarding **claim 20**, Narenda discloses everything claimed as applied above (see claim 1). Narenda inherently discloses temporal filter as evident by the use of the Kalman filter block (col. 9, lines 28-61).

Regarding **claim 29**, Narenda discloses a compact deployable acoustic sensor. Narenda's disclosure comprises filtering (54) microphones (16-17), and combining the audio signals via a computing means using covariance matrix to process the signals in a nonlinear manner, and the performing nonlinear estimation processing, therein, as claimed, wherein the anti-aliasing filters reads on dynamically adjusting to match to match each of the processed audio signals in amplitude and phase (col. 1, lines 58-68 - col. 2, lines 1-5, and 62-68, col. 5, lines 55-62, col. 7, lines 64- col. 8, lines 1- 54 and figure 3-5).

Regarding **claim 30**, Narenda discloses a compact deployable acoustic sensor. Narenda's disclosure comprises filtering (54) microphones (16-17), and combining the audio signals via a computing means using covariance matrix to process the signals in a nonlinear manner, and the performing nonlinear estimation processing, therein, as claimed (col. 1, lines 58-

68 - col. 2, lines 1-5, and 62-68, col. 5, lines 55-62, col. 7, lines 64- col. 8, lines 1- 54 and figure 3-5).

Regarding **claim 31**, Narenda discloses everything claimed as applied above (see claim 30). Narenda further discloses calculating a median (col. 8, lines 43-54).

Regarding **claim 37**, Narenda discloses a compact deployable acoustic sensor. Narenda's disclosure comprises filtering (54) microphones (16-17), and combining the audio signals via a computing means using covariance matrix to process the signals in a nonlinear manner, and the performing nonlinear estimation processing, therein, as claimed (col. 1, lines 58-68 - col. 2, lines 1-5, and 62-68, col. 5, lines 55-62, col. 7, lines 64- col. 8, lines 1- 54 and figure 3-5), and Narenda further discloses beamforming technique (col. 6, lines 41- col. 7, lines 1-6), which reads on the nonlinear signal estimation processing being based on multiple values of each signal over a period of time; and Narenda inherently discloses temporal filter as evident by the use of the Kalman filter block (col. 9, lines 28-61).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claim 2** is are rejected under 35 U.S.C. 103(a) as being unpatentable over Narenda in view of Bhadkamkar et al., U. S. Patent No. 6002776.

Regarding claim 2, Narenda discloses everything claimed as applied above (see claim 1). However, Narenda fails to disclose delaying and scaling the audio signal from each microphone.

Regarding delaying and scaling, in a similar field of endeavor, Bhadkamkar disclose a microphone array using nonlinear processing of the microphone signals comprising delay, wherein delay obviously constitutes scaling as well (col. 1, lines 63 – col. 2, lines 1-5).

It would have been obvious to one of the ordinary skill in the art at the time the invention was made to modify the invention of Narenda by implementing delay and scaling of the audio signals from the microphone for the purpose of enabling adequate processing of each signal at the beamforming phase, wherein delaying and scaling are commonly used techniques in beamforming.

6. **Claim 23** is rejected under 35 U.S.C. 103(a) as being unpatentable over Narenda.

Regarding claim 23, Narenda discloses a compact deployable acoustic sensor.

Narenda's disclosure comprises filtering (54) microphones (16-17), and combining the audio signals via a computing means using covariance matrix to process the signals in a nonlinear manner, and the performing nonlinear estimation processing, therein, as claimed (col. 1, lines 58-68 - col. 2, lines 1-5, and 62-68, col. 5, lines 55-62, col. 7, lines 64- col. 8, lines 1- 54 and figure 3-5). However, Narenda fails to specifically disclose a digital filter, therein as claimed. The examiner takes official notice, that a digital filter was well known in the art. With the use of a digital filter, such as FIR for corresponding the inverse transfer function of microphone input being a commonly used technique in the art, it would have been obvious to one of the ordinary skill at the time of the invention to implement an digital filter for the purpose

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of the characteristics of an inverse transfer function to realized by a digital filter so the appropriate coefficients are generated by the filter for ensuring the desired optimal performance of the beamforming process.

7. **Claims 24-28** are allowed.

8. **Claims 3-8, 13-17, 21, 32-36, and 38** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Response to Arguments***

9. Applicant's arguments with respect to claims 1-22 have been considered but are moot in view of the new ground(s) of rejection.

The applicant's arguments are basically directed to the prior art of reference not disclosing beamforming in a non-linear manner in respect to a mathematical technique. However, the claim language of the claims fails to limit the beamforming process to such a technique. The claim language, merely states, "non-linear manner". A new reference of prior art has been applied to beamforming using a non-linear technique, where a median value of the processes signals are calculated.

#### ***Conclusion***

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3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura A Grier whose telephone number is (703) 306-4819. The examiner can normally be reached on Monday - Friday, 7:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on (703) 305-4386.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

**Or faxed to:**

**(703) 872-9314 (for Technology Center 2600 only)**

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

LAG

April 5, 2004

MINSUN OH HARVEY  
PRIMARY EXAMINER